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Catalogue of Orthoptera Caelifera from the Iberian Peninsula and Balearic Islands (Orthoptera: Caelifera)

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Abstract

Caeliferan species belonging to the Ibero-Balear fauna are inventoried. Lists are drawn up on the basis of data available in the literature and from a study of specimens collected by the authors during the last 30 years. The last inventory of species and subspecies belonging to the fauna of the Iberian Peninsula and Balearic islands was in 1987. In five different lists we take into consideration contributions from various authors since 1987. Listings are: 1) species belonging to the Ibero-Balear fauna, which include 153 taxa belonging to three superfamilies, five families and eight subfamilies, 2) species from the Arán Valley not found in the Peninsula itself: two taxa, 3) alien species: five taxa, 4) species of doubtful presence in the Iberian Peninsula: six taxa and 5) nullified species for the Iberian Peninsula: 19 taxa.

Introduction

Caelifera from the Iberian Peninsula have long been studied (Vandelli 1797, Rambur 1838, Bolívar 1876a, 1876b, 1876c, 1900, Cazurro 1888) and their diversity has led to many Spanish, European and American entomologists studying them in detail. The last, particularly, have taken advantage of their more or less sporadic visits to the Peninsula to collect specimens, the result of which has been the publication of many papers on specimens collected within the geographical and political boundaries of the peninsular territories of Spain, Portugal, and the Balearic Islands.

Of particular note among such publications, due to their number, are the catalogues and checklists, annotated to varying degrees, by Clemente *et al.* (1987), Défaut (1987), Gangwere & Llorente (1992), Gangwere & Morales (1970), Herrera (1982), Ragge (1965)— which were used to make catalogues and checklists at European level, for example, those of Heller *et al.* (1998) and Schmidt & Lilke (1996).

In these and other lists, several species cited as belonging to the fauna present in the Iberian Peninsula and the Balearic Islands are surprising. In some cases the species are cited as new for Iberian fauna, even though their current known distribution makes their presence doubtful. In other cases, the cited species have been collected just once, often more than a century ago, and have not been collected again even after systematic sampling. Other species are included, despite being excluded from the Iberian fauna by different authors in their revisions. In contrast, the subspecific category is sometimes not included in the lists, though since it affects widely distributed taxa, it is quite important.

Explanation of this has diverse causes. In some cases the lists have been made without the necessary information and with no criticism of extant data. In other cases, mistaken identifications are simply accepted or maintained. On the other hand, due to the geographical position of the Iberian Peninsula, the lists sometimes include alien species which, carried by winds across the Straits of Gibraltar, may arrive in the Peninsula or its islands and be collected sporadically; as a consequence, such species are frequently considered as belonging to the Iberian fauna.

Lastly, it should be taken into account that the Arán Valley, which is located on the northern slopes of the Pyrenees and consequently, outside the Peninsula from a biogeographical point of view, is considered by many to form part of the Iberian Peninsula, as are the species that inhabit it. As a consequence, several species collected in this valley are considered as belonging to the Iberian fauna, which affects their biogeographical category as well as the definition of Iberian fauna.

In view of this situation and with the intention of bringing coherence to the lists of the Caelifera taxa living in the Iberian Peninsula and Balearic Islands, and as a first step to a general study of the same, we present a critical catalogue of these species. Using as a starting point the most recent list of Iberian Caelifera fauna (Clemente *et al.*, 1987), ours takes into account the contributions made in the last 20 years.

Material and Methods

The work of Heller *et al*. (1998), which rested on a thorough review of the literature up to 1998, is the starting point for the present catalogue. But since that work does not take into account the subspecific category, other papers have also been considered: Llorente & Presa (1997) in the case of Pamphagidae, Clemente *et al.* (1987) for Catantopidae, Ragge & Reynolds (1998) for Gomphocerinae and Schmidt & Lilke (1996) for Oedipodinae. For other groups, several literature sources were consulted.

When conflicting opinions exist concerning the validity of a given taxon, its distribution area, *etc.*, we have generally chosen the most recent opinion. In some cases, especially for several species and subspecies of Gomphocerinae, when one of the proposals includes acoustic production, the date criterion has not been respected, since the sound produced by orthopterans is of high taxonomic value.

The catalogue is organised as follows. First, is a list of the taxa with stable populations in the considered area, as verified by the authors or other specialists. Therefore, these species should be considered as constituents of the fauna of the Iberian Peninsula. If a taxon not appearing in the reference lists is included in this list, the reference which supports its inclusion is mentioned. Species of Iberian fauna considered threatened (Presa *et al.* 2006) are marked with an asterisk.

Three more lists follow: the first includes the species living in the Arán Valley which are not present in the Iberian Peninsula; the second includes alien species, whose presence in the considered area

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is doubtful; the third includes the species which, in our opinion, should be removed from the Caelifera taxonomical lists referring to the Iberian Peninsula.

In all cases, the reference that supports the inclusion of each taxon in a particular list is given. Where appropriate, other interesting data, such as the date of the last known capture, the cause of inclusion in the list, *etc.*, are given.

All the lists have been systematically arranged following Heller *et al.* (1998).

Results

1. Lists of species belonging to the Iberian-Balearic fauna

TETRIGOIDEA
TETRIGIDAE
Paratettix meridionalis (Rambur, 1838)
Tetrix bipunctata (Linnaeus, 1758)
Tetrix bolivari Saulcy, 1901
Tetrix ceperoi (Bolívar, 1887)
Tetrix subulata (Linnaeus, 1758)
Tetrix tenuicornis Sahlberg, 1893
Tetrix undulata (Sowerby, 1806)
Uvarovitettix depressus (Brisout de Barneville, 1849)
Uvarovitettix nodulosus (Fieber, 1853)
TRIDACTYLOIDEA
TRIDACTYLIDAE
Xya iberica Günther, 1990
Xya pfaendleri (Harz, 1970)
Xya variegata Latreille, 1809
ACRIDOIDEA
PAMPHAGIDAE
Prionotropis flexuosa flexuosa (Serville, 1838)
Prionotropis flexuosa perezii (Bolívar, 1878)
Prionotropis flexuosa sulphurans Bolívar, 1921
Acinipe comptei Llorente, 1980
Acinipe deceptoria (Bolívar, 1878)
Acinipe hesperica Rambur, 1838
Acinipe ignatii Presa y Llorente, 1983
Acinipe mabillei (Bolívar, 1878) (Presa *et al.* 2000)
Acinipe paulinoi (Saussure, 1887)
Acinipe perisi Presa y Llorente, 1983
Acinipe segurensis (Bolívar, 1908)
Acinipe tibialis (Fieber, 1853)
Eumigus ayresi Bolívar, 1912
Eumigus cucullatus cucullatus (Bolívar, 1878)
Eumigus cucullatus almeriensis Bolívar, 1912
Eumigus monticola (Rambur, 1838)
Eumigus punctatus punctatus (Bolívar, 1902)
Eumigus punctatus templadoi Llorente & Presa, 1986
Eumigus punctatus calarensis Presa, Llorente & García, 2000 (Presa *et al.* 2000)
Eumigus rubioi Harz, 1973
Euryparyphes terrulentus (Serville, 1838)
Kurtharzia nugatoria (Navás, 1908)
** Kurtharzia sulcata* (Bolívar, 1912)
Ocnerodes brunnerii brunnerii (Bolívar, 1876)
Ocnerodes brunnerii cyanipes Bolívar, 1902
Ocnerodes fallaciosus Bolívar, 1912
Ocnerodes prosternalis prosternalis Bolívar, 1912
Ocnerodes prosternalis pazae Llorente & Presa, 1984
Ocnerodes soleri Llorente & Presa, 1984
PYRGOMORPHIDAE
Pyrgomorpha conica (Olivier, 1791)
ACRIDIDAE
ACRIDINAE
Truxalis nasuta (Linnaeus, 1758)
Acrida ungarica mediterranea Dirsh, 1949 (Lluciá Pomares 2002)
CALLIPTAMINAE
Calliptamus barbarus (Costa, 1836)
Calliptamus italicus (Linnaeus, 1758)
Calliptamus wattenwylianus (Pantel, 1896)
Paracaloptenus bolivari Uvarov, 1942
CATANTOPINAE
Cophopodisma pyrenaea (Fischer, 1853)
Miramella alpina subalpina (Fischer, 1850)
Pezotettix giornae (Rossi, 1794)
Podisma pedestris (Linnaeus, 1758)
Podisma cantabricae Morales -Agacino, 1950
Podisma carpetana carpetana (Bolívar, 1898)
Podisma carpetana ignatii Morales-Agacino, 1950
CYRTHACANTACRIDINAE
Anacridium aegyptium (Linnaeus, 1764)
DERICORYTHINAE
** Dericorys carthagonovae* Bolívar, 1897
EYPREPOCNEMINAE
Eyprepocnemis plorans (Charpentier, 1825)
Heteracris adspersa (Redtenbacher, 1889)
Heteracris littoralis (Rambur, 1838)
TROPIDOPOLINAE
Tropidopola cylindrica (Marschall, 1836)
OEDIPODINAE
Acrotylus fischeri Azam, 1901
Acrotylus insubricus (Scopoli, 1786)
Acrotylus patruelis (Herrich-Schäffer, 1838)
Aiolopus strepens (Latreille, 1804)
Aiolopus thalassinus (Fabricius, 1781)
Calephorus compressicornis (Latreille, 1804)
Jacobsiella imitans (Brunner, 1882)
Leptopternis candidus lusitanicus Ebner, 1941
Locusta migratoria cinerascens (Fabricius, 1781)
Locusta migratoria migratoria Linnaeus, 1758
Mecostethus parapleurus (Hagenbach, 1822)
Mioscirtus wagneri maghrebi Fernandes, 1968
Morphacris fasciata (Thunberg, 1815)
Oedaleus decorus (Germar, 1826)
Oedipoda caerulescens (Linnaeus, 1758)
Oedipoda charpentieri Fieber, 1853
Oedipoda fuscocincta fuscocincta Lucas, 1849
Oedipoda fuscocincta caerulea Saussure, 1884
Oedipoda germanica (Latreille, 1804)
Oedipoda miniata (Pallas, 1771)
Paracinema tricolor bisignata (Charpentier, 1825)
** Platypygius platypygius* (Pantel, 1886)
Pseudosphingonotus azurescens (Rambur, 1838) (Défaut 2005a)
Pseudosphingonotus morini Défaut, 2005 (Défaut 2005c)
Psophus stridulus (Linnaeus, 1758)
Sphingonotus caerulans caerulans (Linnaeus, 1767)
Sphingonotus gypsicola Lluciá-Pomares, 2006 (Lluciá-Pomares 2006)
Sphingonotus lluciapomaresi (Défaut, 2005) (Lluciá-Pomares 2006)

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Sphingonotus octofasciatus (Serville, 1839)
Sphingonotus rubescens (Walker, 1870)
Sphingonotus uvarovi Chopard, 1923
Stethophyma grossum (Linnaeus, 1758)
GOMPHOCERINAE
* *Arcyptera brevipennis* (Brunner von Wattenwyl, 1861)
Arcyptera fusca (Pallas, 1773)
Arcyptera microptera (Fischer Waldheim, 1833)
Arcyptera tornosi Bolívar, 1884
Brachycrotaphus tryxalicerus (Fischer, 1853)
Chorthippus albomarginatus (De Geer, 1773)
Chorthippus apicalis (Herrich-Schäffer, 1840)
Chorthippus apricarius (Linnaeus, 1758)
Chorthippus biguttulus (Linnaeus, 1758)
Chorthippus binotatus (Charpentier, 1825)
Chorthippus brunneus (Thunberg, 1815)
Chorthippus cazurroi (Bolívar, 1898)
Chorthippus dorsatus (Zetterstedt, 1821)
Chorthippus jacobsi Harz, 1975
Chorthippus jucundus (Fischer, 1853)
Chorthippus mollis (Charpentier, 1825)
Chorthippus montanus (Charpentier, 1825)
Chorthippus nevadensis Pascual, 1978
Chorthippus parallelus parallelus (Zetterstedt, 1821)
Chorthippus parallelus erythropus Faber, 1958
Chorthippus reissingeri Harz, 1972
Chorthippus vagans (Eversmann, 1848)
Chorthippus yersini Harz, 1975
Chrysochraon dispar (Germar, 1834)
Dociostaurus crassiusculus (Pantel, 1886)
Dociostaurus genei (Ocskay, 1832)
Dociostaurus hispanicus Bolívar, 1898
Dociostaurus jagoi occidentalis Soltani, 1978
Dociostaurus maroccanus (Thunberg, 1815)
Euchorthippus angustulus Ramme, 1931
Euchorthippus chopardi Descamps, 1968
Euchorthippus declivus (Brisout de Barneville, 1849)
Euchorthippus elegantulus gallicus Maran, 1957 (Orci *et al.*, 2002)
Euthystira brachyptera (Ocskay, 1826)
Gomphoceridius brevipennis (Brisout de Barneville, 1858)
Gomphocerus sibiricus (Linnaeus, 1767)
Myrmeleotettix maculatus (Thunberg, 1815)
Omocestus antigai (Bolívar, 1897)
Omocestus bolivari Chopard, 1939
* *Omocestus femoralis* Bolívar, 1908
Omocestus haemorrhoidalis (Charpentier, 1825)
Omocestus minutissimus (Bolívar, 1878)
Omocestus navasi Bolívar, 1908 (Clemente *et al.* 1999)
Omocestus panteli (Bolívar, 1887)
Omocestus petraeus (Brisout de Barneville, 1856)
Omocestus raymondi (Yersin, 1863)
Omocestus rufipes (Zetterstedt, 1821)
Omocestus uhagonii (Bolívar, 1876)
Omocestus viridulus viridulus (Linnaeus, 1758)
Omocestus viridulus kaestneri Harz, 1972
Ramburiella hispanica (Rambur, 1838)
Stauroderus scalaris (Fischer de Waldheim, 1846)
Stenobothrus bolivarii (Brunner, 1876)
Stenobothrus festivus Bolívar, 1887
Stenobothrus fischeri glaucescens Bolívar, 1897 (Clemente *et al.* 1989)
Stenobothrus grammicus Cazurro, 1888
Stenobothrus lineatus (Panzer, 1796)
Stenobothrus nigromaculatus (Herrich-Schäffer, 1840)
Stenobothrus stigmaticus (Rambur, 1838)
Xerohippus occidentalis Pascual & Aguirre, 1996

2. Species from the Arán Valley not present in the Iberian Peninsula

Bohemanella frigida strandi (Fruhstorffer, 1921) (Gosálvez *et al.* 1984, Lluciá-Pomares 2002, Olmo Vidal 2006)

Gomphocerippus rufus (Linnaeus, 1758) (Lluciá-Pomares 2002, Olmo Vidal 2006)

3. Alien species

Acanthacris ruficornis citrina (Fabricius, 1787). Last collected in 1991 (Barranco & Pascual 1994)

Schistocerca gregaria (Forskal, 1775). Last collected in 1953 (Aguirre-Segura *et al*, 1995)

Acrotylus longipes rosea Bolívar, 1908. Only collected in 1905 (Presa & Llorente 1979)

Scintharista notabilis (Walker, 1870). Only collected in 1888 (Cazurro 1888)

Thalpomena algeriana Lucas, 1849. Only collected in 1942 (Morales Agacino 1942)

4. Doubtfully present species in the Iberian Peninsula and Balearic Islands

Euryparyphes bolivari (Stål, 1876). Only collected in 1876 (Llorente & Presa 1997)

Euryparyphes stali (Borsmans, 1879). Only collected in 1879 (Llorente & Presa 1997)

Epacromius tergestinus (Charpentier, 1845). Only collected in 1886 (Larrumbe 1992)

Celes variabilis (Pallas, 1771). Last collected in 1936 (Olmo Vidal 2006).

Chorthippus ariasi (Bolívar, 1908). Only collected in 1908 (Bolívar 1908)

Chorthippus chloroticus (Bolívar, 1908). Only collected in 1908 (Bolívar 1908)

5. Nullified species for the Iberian Peninsula and Balearic Islands

Acinipe affinis (Fischer, 1853). Synonym of *Acinipe mabillei* (Bolívar, 1878) (Presa *et al.*, 2000)

Acrida turrita Linnaeus, 1758. Mistaken identification (Gangwere & Llorente 1992, Llucià Pomares 2002)

Calliptamus siciliae Ramme, 1927. French and Italian endemism; species not present in the Iberian Peninsula or Balearic Islands (Llorente 1982, Voisin 2003)

Cophopodisma ibera Ramme, 1951. Synonym of *Cophopodisma pyrenaea* (Fischer, 1853) (Défaut 1999, Voisin 2003)

Miramella formosanta (Fruhstorffer, 1921). Transcription error of the collecting locality; possible confusion between Biella (Alps) and Viella (Pyrenees) (Nadig 1987)

Heteracris annulosus Walker, 1870. Species not present in the Iberian Peninsula or Balearic Islands (Grunshaw 1991)

Acrotylus insubricus inficitus (Walker, 1870). Synonym of *Acrotylus*

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insubricus (Scopoli, 1786) (La Greca 1990)

Aiolopus simulatrix (Walker, 1870). Species not present in the Iberian Peninsula or Balearic Islands (Schmidt & Lilge 1997) and of doubtful identification (Gangwere & Llorente 1992)

Pseudosphingonotus lluciapomaresi Défaut, 2005. Synonym of *Sphingonotus lluciapomaresi* Défaut, 2005 (Lluciá-Pomares 2006)

Sphingonotus arenarius (Lucas, 1849), Synonym of *Pseudosphingonotus azurescens* (Rambur, 1838) (Défaut 2005b)

Sphingonotus azurescens (Rambur, 1838). Synonym of *Pseudosphingonotus azurescens* (Rambur, 1838) (Défaut 2005a)

Sphingonotus coerulans corsicus Chopard, 1923. Mistaken identification (Défaut 2003)

Arcyptera brevipennis vicheti Harz, 1975. Synonym of *Arcyptera brevipennis brevipennis* (Brunner von Wattenwyl, 1861) (García *et al.* 1996)

Chorthippus binotatus moralesi Uvarov, 1954. Synonym of *Chorthippus binotatus binotatus* (Charpentier, 1825) (Ragge & Reynolds 1998)

Chorthippus binotatus saulcy (Krauss, 1888). Synonym of *Chorthippus binotatus binotatus* (Charpentier, 1825) (Ragge & Reynolds 1998)

Dociostaurus monserrati García & Presa, 1984. Synonym of *Dociostaurus jagoi occidentalis* Soltani, 1978 (García *et al.* 2005)

Euchorthippus pulvinatus gallicus Maran, 1957. Synonym of *Euchorthippus elegantulus gallicus* Maran, 1957 (Orci *et al.* 2002)

Omocestus broelemanni (Azam, 1906). Synonym of *Omocestus antigai* (Bolívar, 1907) (Clemente *et al.*, 1990, Ragge & Reynolds 1998)

Omocestus burri Uvarov, 1936. Synonym of *Omocestus minutissimus* (Bolívar, 1878) (Ragge & Reynolds 1998)

Discussion

For the Oedipodinae, some very recent studies propose new taxa, others propose a change of genus with some genera becoming new synonyms. In our opinion, judgement on these new taxa, as well as on taxonomical changes, should be reserved, since some as yet unpublished information (Larrosa Pérez 2005) offers other possible interpretations. To avoid conflict with the general criteria adopted, the most recent reference has been respected.

As regards species living in the Arán Valley, but not present in the Iberian Peninsula, we believe with almost complete certainty, they are not present in the Iberian Peninsula. In the two considered cases, they are species of very particular distributions and biological demands (Gosálvez *et al.* 1984, Voisin 2003), which make it virtually impossible for them to be present on the southern slopes of the Pyrenees.

Future consideration should be given to some possible changes to species considered doubtful in the Iberian Peninsula and Balearic Islands. Cases of Pamphagidae species based on specimens from northern Africa are, in our opinion, labelling errors (Llorente & Presa 1997). Thus, these species have never been, and never will be, collected in the Iberian Peninsula. As for *E. tergestinus* and *C. variabilis*, despite the lack of captures and because they are species living in very particular habitats (Voisin 2003), it is possible that they could be found in still unknown places, as has occurred in other areas (Voisin 2003, Llucià Pomares 2002) or with other species, as *P. platypygius* (Presa *et al.* 2006). The case of the two *Chorthippus* species is similar to the above: only the original description of *Ch. ariasi* exists, no specimens reside in any collection. Taking into account the description and the comments made by Bolívar (1908), *Ch. ariasi* is almost certainly a synonym of *Ch. binotatus*. Although only one specimen is known (kept at the MNCN in Madrid), the case of *Ch. chloroticus* is, in our opinion, similar to the above; it should be regarded as a new synonym of *Ch. jacobsi*, taking into account its morphology, collecting locality and the opinion of Bolívar (1908), who thought it very similar to *Ch. biguttulus*.

Finally, as regards the Caeliferan fauna living in the Iberian Peninsula, only the species included in the "List of species belonging to the Iberian-Balearic fauna" should be taken into account. Other species, e.g., *Bohemanella frigida strandi*, *Gomphocerippus rufus*, *Epacromius tergestinus* and *Celes variabilis*, could be added, but only with the relevant notations. For the elaboration of identification keys or other studies, the inclusion or not of alien species should be left to the authors' discretion.

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